



## IR transmitter circuit

### LED/IR LED

An LED (Light Emitting Diode) is a device that converts electricity to light when forward biased. The IR LED (Infrared LED) converts the light, as the name implies, to Infrared light (invisible to the human eye).

### Capacitor

Capacitors have two main features. One of which is a function to charge or discharge electricity. This function is applied to smoothing circuits of power supplies, backup circuits of microcomputers, and timer circuits that make use of the periods to charge or discharge electricity. The other is a function to block the flow of DC. This function is applied to filters that extract or eliminate particular frequencies. This is indispensable to circuits where excellent frequency characteristics are required.

In other words, a capacitor block DC but passes AC.

### Circuit\*

In this circuit the IR LED is forward biased (or powered) with a 1.5V battery.

In series with the battery, but after the IR LED, is a capacitor. This capacitor serves as a blocking filter to block the DC from the battery going “into” the signal source.

The signal source can be anything, but in this case it is a radio. The output (headphone) of the radio is connected between the capacitor and the common ground (minus side of the battery).

When the radio is off, there is just a DC signal across the IR LED and nothing can be heard on the receiver. DC is basically a constant, level (non-changing) signal (the output of a battery, for example, would be a DC “signal”). However, when the radio is turned on an AC (changing signal) is “injected” into the IR LED, because the capacitor lets the changing signal from the radio pass (or lets it go “through”), constantly changing the signal that is emitted from the IR LED.

The receiver detects this changing signal and converts the light transmitted from the transmitter into electricity (the solar cell) and the to sound (the speaker/amplifier)

\* Normally, one would put a resistor in series with the LED to limit the current that can flow through the LED preventing damage to it.